



This study utilized the psychomotor vigilance test (PVT) and trail-making test B (TMT-B) to assess cognitive impairment immediately post-chemotherapy” Khan et al (2019).

Abstract:

BACKGROUND: Cognitive impairment is commonly reported in patients receiving chemotherapy, but the acuity of onset is not known. This study utilized the psychomotor vigilance test (PVT) and trail-making test B (TMT-B) to assess cognitive impairment immediately post-chemotherapy.

METHODS: Patients aged 18-80 years receiving first-line intravenous chemotherapy for any stage of breast or colorectal cancer were eligible. Patient symptoms, peripheral neuropathy and Stanford Sleepiness Scale were assessed. A five-minute PVT and TMT-B were completed on a tablet computer pre-chemotherapy and immediately post-chemotherapy. Using a mixed linear regression model, changes in reciprocal transformed PVT reaction time (mean 1/RT) were assessed. A priori, an increase in median PVT reaction times by > 20 ms (approximating PVT changes with blood alcohol concentrations of 0.04-0.05 g%) was considered clinically relevant.

RESULTS: One hundred forty-two cancer patients (73 breast, 69 colorectal, median age 55.5 years) were tested. Post-chemotherapy, mean 1/RT values were significantly slowed compared to pre-chemotherapy baseline ($p = 0.01$). This corresponded to a median PVT

reaction time slowed by an average of 12.4 ms. Changes in PVT reaction times were not correlated with age, sex, cancer type, treatment setting, or use of supportive medications. Median post-chemotherapy PVT reaction time slowed by an average of 22.5 ms in breast cancer patients and by 1.6 ms in colorectal cancer patients. Post-chemotherapy median PVT times slowed by > 20 ms in 57 patients (40.1%). Exploratory analyses found no statistically significant association between the primary outcome and self-reported anxiety, fatigue or depression. TMT-B completion speed improved significantly post-chemotherapy ($p = 0.03$), likely due to test-retest phenomenon.

CONCLUSIONS: PVT reaction time slowed significantly immediately post-chemotherapy compared to a pre-chemotherapy baseline, and levels of impairment similar to effects of alcohol consumption in other studies was seen in 40% of patients. Further studies assessing functional impact of cognitive impairment on patients immediately after chemotherapy are warranted.

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Reference:

Khan, O.F., Cusano, E., Raissouni, S., Pabia, M., Haeseker, J., Bosma, N., Ko, J.J., Li, H., Kumar, A., Vickers, M.M. and Tang, P.A. (2019) Immediate-term cognitive impairment following intravenous (IV) chemotherapy: a prospective pre-post design study. *BMC Cancer*. 2019 Feb 14;19(1):150. doi: 10.1186/s12885-019-5349-2.

